REMARKS

Claims 1-13 are currently pending with the entry of this Amendment.

Claims 1-13 stand rejected.

Rejections under 35 U.S.C. § 103(a)

1. Background

The claimed technique operates on an input "data bit" stream and an "output waveform signal." Embodiments of the claimed subject matter may be applied to a Commercial Off-The-Shelf (COTS) or Government Off-The-Shelf (GOTS) chipsets without modification to the internals of the chipset as shown in Figure 7 of the instant application. For example, with reference to Figure 7, the PHY Layer (705) in a communications system typically takes in a data bit (702c) stream from the MAC Layer (701). The PHY Layer (705) then creates the baseband or IF waveform. For an Orthogonal Frequency Division Multiplexing ("OFDM") PHY Layer, the data bits are modulated onto multiple subcarriers and summed together to produce the baseband waveform. The claimed peak-to-average power ratio ("PAPR") reduction technique may then manipulate the input data stream to generate multiple OFDM symbols. Symbols with PAPR below a threshold are selected for transmission to generate the multiple un-correlated OFDM symbols.

2. Claims 3-13

On pages 2-5 of the Action the Office improperly rejected Claims 3-13 under 35 U.S.C. §103(a) as being unpatentable over Corral (U.S. Pat. No. 6,925,128; hereinafter "Corral") in view of Feng (U.S. Pub. No. 2004/0146115; hereinafter "Feng"). While this rejection appears to be premised upon a misunderstanding of what Corral and Feng fairly teach, Applicant has amended independent Claims 3, 6, and 8 to simply to clarify the claimed subject matter. No new matter has been added.

In contrast to the claimed subject matter, Corral appears to be directed to a reordering of a data stream by block encoding to reduce the peak-to-average power ratio. Corral requires input vectors to form a Toeplitz structure. Through Corral's generation of plural input data vectors, a reordering of elements is required utilizing a rotation of input vector to form a circulant matrix (an IFFT is used to perform this circular convolution). In contrast, the claimed subject matter requires no such matrix operation, reordering, or circular convolution using an IFFT. Furthermore, the claimed subject matter requires no modification to the Baseband Processor (PHY Layer) as discussed in Corral. In choosing which of the "approximating OFDM outputs" to use, Corral discloses two embodiments, neither of which are similar to the claimed method. In a first embodiment, Corral compares the approximating OFDM outputs to a "target output signal" (*see* Corral col. 9 ll. 44-48) in an attempt to minimize "total absolute error" between the plural approximating OFDM outputs and the "target output signal" (col. 10 ll. 27-38) and

selects for transmission the approximating OFDM output that best matches this criteria. In a second embodiment (col. 10 ll. 39-48), Corral "choose[s] as the desired output one of the plurality of approximating OFDM outputs having an **average power larger than any other of the plurality of approximating OFDM outputs** or at least large enough to satisfy a power threshold . . ." (emphasis supplied) This is in stark contrast to the claimed method (*see* independent Claims 3, 6, 8, and 11) where an OFDM symbol having a PAPR less then a threshold value is selected for transmission.

The secondary reference Feng does nothing to overcome the above-noted deficiency of Corral. Accordingly, withdrawal of the obviousness rejections of independent Claims 3, 6, 8, and 11 is respectfully requested.

Since Claims 4, 5, 7, 10, 12, and 13 each depend from one of Claims 3, 6, 8, and 11 discussed above, withdrawal of the obviousness rejections of Claims 4, 5, 7, 10, 12, and 13 is respectfully requested without recourse to the additional patentable limitations contained respectively therein.

3. Claims 1-2

On pages 5-7 of the Action the Office improperly rejected Claims 1-2 under 35 U.S.C. §103(a) as being unpatentable over Weerackody (U.S. Pat. No. 6,950,389; hereinafter "Weerackody") in view of Shattil (U.S. Pub. No. 2004/0141548; hereinafter

"Shattil") and Feng. The rejection of Claims 1-2 also appears to be premised upon a misunderstanding of the claimed subject matter and the references of record.

For example, the primary reference Weerackody describes an OFDM transmission system that utilizes random phases across OFDM sub-carrier components and differential encoding so that the phase information (*i.e.*, phase values) does not have to be explicitly transmitted to a receiver. Weerackody differentially encodes data symbols relative to a previous encoded output so that the phase values on the encoding process are the same. In the disclosed process, Weekackody measures the PAPR of a modulated signal and compares the PAPR with a threshold. If the PAPR exceeds the threshold, a new phase sequence is selected to create a different data signal, and the PAPR is then measured for the new data signal (*see* Col. 4., lines 12-67).

The Office, however, admits that Weerackody fails to disclose sequencing data according to a data vector and appending a data map signal associated with the data vector and improperly attempts to utilize Shattil to supplement these deficiencies. Shattil is generally directed to Carrier Interferometry ("CI"), a type of spread spectrum multiple access typically employed with OFDM. CI spreading codes are commonly used to spread data symbols across multiple OFDM subcarriers for diversity benefits and to shape the resulting superposition of coded subcarriers for reducing the PAPR of the transmitted signal. While Shattil appears to disclose providing overhead bits to inform a respective receiver of the changes to the transmission signal (*see* Paragraph [0008]),

Weerackody teaches away from a combination with Shattil as Weerackody is specifically directed to not informing any changes to a transmission signal to the receiver (*see* Col. 1, lines 29-43) and Weerackody is directed to manipulation of phase values rather than data bits.

In contrast to the teachings of Weerackody, Shattil and Feng, Claim 1 recites:

> A method for reducing the peak-to-average power ratio of a communication signal comprising the steps of:
>
> (a) sequencing a data signal according to a data vector to thereby create a sequenced data signal;
>
> (b) modulating a first plurality of carrier waves at a second plurality of frequencies with said sequenced data signal to thereby create a modulated signal;
>
> (c) measuring the peak-to-average power ratio of the modulated signal;
>
> (d) comparing said power ratio with a predetermined threshold;
>
> (e) if said power ratio exceeds said predetermined threshold, sequencing said data signal according to a data vector different from previous data vectors to thereby create a sequenced data signal different from previous sequenced data signals and repeating steps (b)-(e) until said power ratio does not exceed said predetermined threshold;
>
> (f) if said power ratio does not exceed said predetermined threshold, appending to the modulated signal a data map signal associated with the data vector for which said power ratio does not exceed said predetermined threshold to thereby create an appended signal;
>
> (g) sampling said appended signal;
>
> (h) reducing amplitude of said samples which exceed a predetermined range to thereby create a reduced amplitude signal;
>
> (i) filtering said reduced amplitude signal to thereby create said communication signal with a reduced peak-to-average power ratio.

In contrast to the claimed subject matter, the primary reference Weerackody fails to disclose sequencing data according to a data vector and appending a data map signal

associated with the data vector as admitted by the Office. The primary reference also is inapplicable to the claimed subject matter as it is directed to manipulation of phase values rather than data bits. Shattil fails to supplement the deficiencies of Weerackody and cannot be combined therewith. Therefore, the rejection of Claims 1-2 under Section 103 would be improper even without addressing the teachings of Feng. Reconsideration and withdrawal of the rejection of Claims 1-2 is thereby respectfully requested in view of the remarks above.

Conclusion

Based on the above explanation, Applicant believes that the present application is in condition for allowance and, as such, it is earnestly requested that Claims 1-13 be allowed to issue in a U.S. Patent.

If the Examiner believes that an in-person or telephonic interview with the Applicant's representatives will expedite the prosecution of the subject patent application, the Examiner is invited to contact the undersigned agents of record.

The Office is requested and hereby authorized to charge the appropriate extension-of-time fees against **Deposit Account No. 08-0870**.

Respectfully submitted,

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